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MACTEC ENVIRONMENTAL RESTORATION SERVICES, LLC

Spectral Gamma-Ray Borehole
Log Data Report

Log Event A

Borehole # 30-04-04

Borehole Information

Farm : C	**Tank :** C-104	**Site Number :** 299-E27-79
N-Coord : 42,790	**W-Coord :** 48,352	**TOC Elevation :** 646.60
Water Level, ft :	**Date Drilled :** 6/30/1974	

Casing Record

Type : Steel-welded	Thickness, in. : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:

This borehole was drilled in June 1974 and completed to a depth of 100 ft with 6-in. casing. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. No information was available that indicated the borehole casing was perforated or grouted; therefore, it is assumed that the borehole was not perforated or grouted. The top of the casing, which is the zero reference for the SGLS, is flush with the ground surface. This borehole is located approximately 8 ft west of a transfer pit.

Equipment Information

Logging System : 2	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1996	**Calibration Reference :** GJO-HAN-13	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number :	1	**Log Run Date :**	02/11/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	98.5	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	78.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	2	**Log Run Date :**	02/12/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	0.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	2.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	3	**Log Run Date :**	02/12/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	2.5	**Counting Time, sec.:**	100	**L/R :** R	**Shield :** N
Finish Depth, ft. :	5.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Event A

Borehole 30-04-04

Log Run Number :	4	**Log Run Date :**	02/12/1997	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	5.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	14.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	5	**Log Run Date :**	02/14/1997	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	79.5	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	13.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Analysis Information

Analyst : E. Larsen

Data Processing Reference : P-GJPO-1787 Analysis Date : 07/29/1997

Analysis Notes :

This borehole was logged by the SGLS in five log runs. Excessive dead time (greater than 50 percent) was encountered during log run two at a depth of 2.5 ft. As a result, log run three was logged in real time from 2.5 to 5 ft. The remainder of the borehole (log runs four and five) was logged in live time, after the dead time dropped below 50 percent. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclide Cs-137 was detected around this borehole. The Cs-137 contamination was detected continuously from the ground surface to 37 ft and nearly continuously from 41.5 to 59.5 ft. Numerous small zones of Cs-137 contamination were detected between 62.5 ft and the bottom of the logged interval (98.5 ft).

The K-40 and Th-232 concentration data are absent from 2.5 to 4.5 ft. The U-238 concentration data are absent from the ground surface to 6.5 ft.

The K-40 concentration values increase from 36.5 to 37.5 and generally remain elevated to a depth of 61 ft. The K-40 concentrations values increase again at 61 ft and remain elevated to the bottom of the logged interval.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank C-104.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Log Event A

Borehole 30-04-04

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.